

CLAIMS

What is claimed is:

1 1. Electromechanical linear drive for an injection molding machine, the
2 drive comprising:

3 a motor housing containing a stator;

4 a hollow cylindrical rotor received concentrically in the housing to form an
5 electric motor having a magnet gap between the rotor and the stator, the rotor having an
6 open end, a closed end, and a central bearing journal extending axially outward from
7 the closed end;

8 a helical gear connected to the rotor for converting rotational movement of
9 the rotor to linear movement;

10 at least two axially pretensioned individual bearings supporting the journal
11 for rotation in the housing, the bearings being spaced apart axially and absorbing
12 longitudinal and transverse forces in opposite directions; and

13 an anti-contact device located at open end of the rotor for preventing
14 contact between the rotor and the housing in the event of eccentric deflection of the
15 rotor with respect to the stator.

1 2. An electromechanical linear drive as in claim 1 wherein the anti-
2 contact device comprises an anti-contact bearing having a radial clearance between
3 the open end of the rotor and the motor housing, the radial clearance being less than
4 the magnet gap.

1 3. An electromechanical linear drive as in claim 1 wherein the anti-
2 contact device comprises one of a fluid dynamic radial bearing and a magnetic radial
3 bearing mounted at the open end of the rotor.

1 4. An electromechanical linear drive as in claim 1 wherein the anti-
2 contact device comprises a sensor which senses eccentric deflection of the rotor with
3 respect to the stator and shuts off the motor when the deflection exceeds a
4 predetermined deflection.

1 5. An electromechanical linear drive as in claim 4 wherein the sensor
2 is a contact sensor mounted on the motor housing adjacent to the open end of the rotor
3 at a distance from the rotor which is smaller than the magnet gap.

1 6. An electromechanical linear drive as in claim 1 wherein the anti-
2 contact device comprises at least three radial bearings which are uniformly distributed
3 about the open end of the rotor and support the rotor radially with respect to the stator.

1 7. An electromechanical linear drive as in claim 1 wherein the helical
2 gear generates a maximum axial thrust, the individual bearings being adjusted to have
3 a pretensioning force which is greater than the maximum axial thrust.

1 8. An electromechanical linear drive as in claim 1 wherein the helical
2 gear is fixed concentrically in the cylindrical rotor and extends toward the open end.

- 1 9. An electromechanical linear drive as in claim 8 wherein the helical
- 2 gear consists of a spindle gear arranged to drive a plasticizing unit of an injection
- 3 molding machine back and forth.